CHAPTER 1

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1.0 OVERVIEW

The basic premise with which a librarian or information scientist starts designing an information system is that 'any serious inquiry involves sorting and sifting in quest of genuine quality' (Winner, 1995). The structure and function of the entire system of any Library / Information System amply depends on what quality of information it wants to cater amongst its target groups and this basic question necessitated libraries to identify the specific needs of these target groups. Over the last five decades it has become one of the most important and popular research areas of Library and Information Science discipline. All of us are well aware that, many studies have already been conducted to identify the users' need, by different scholars and libraries, just to understand, fulfil and satisfy the specific requirements of the users. Researches have been conducted to illuminate how the users discover, shape, or create information as part of the ongoing nature of their lives and works, how the resources and rules of users’ situations facilitate or limit this discovery of information, and elevate the idea of designing the Information Systems so that the users can be served better.
1.1 STATEMENT OF THE PROBLEM

Nevertheless, the few basic questions which remain at the beneath of all these activities are, how to understand, what shall be the mechanism to ascertain and how to interpret such requirements precisely. In other words, the research methods to use often remains as a basic issue of conducting research on determining the requirements of the users of information systems.

Historically, information systems research inherited the natural sciences paradigm (Mumford, 1991). Intrinsic psycho-social nature of the problem compelled the researchers to take the refuge of easily available social science research methods, primarily quantitative research methods, without remodelling and developing the much needed theoretical framework of research methodologies. The quantitative models, borrowed from natural sciences suited to science laboratories, were transferred directly to information science research in an attempt to gain recognition and legitimisation as a research area. In addition to that "... the demand for accountability and assessment in its various guises has in the past led to the entrenchment of many quantitative methods of investigation" (Gorman and Clayton, 1997). The contemplation of the philosophical under-pinning and the question of appropriateness of the methods, however, not addressed properly.
As a result of which, a large number of studies have been conducted with least judgment of the usability of the methods. In other words, the most of the researchers took it granted that the available quantitative methods are applicable in the user studies, without proper analysis and necessary understanding of the theoretical background of the methodologies. Even, for many information professionals, the outcomes of such researches do not address the issues that are not readily quantifiable.

However, they failed to understand that the need of human being could not be comprehended, assessed and interpreted by the natural science paradigms. The concept of CONTEXT in which a human being actually behaves, remained unnoticed. It is basically the qualitative research methods, which handle such situations, were not utilized, though "A more qualitative approach to information issues and problems has the benefit of presenting new answers to old problems, or at least different perspectives derived from potentially richer data. The approach also might be said to provide broader insights not only into existing issues and problems, but also into so far unexamined areas of information work" (Gorman and Clayton, 1997). It is, therefore, an urgent need of the time to have an investigation over the usability of qualitative methods, to be used in understanding the library and information users.
In an electronic environment, Online Public Access Catalogues (OPAC) helps the librarians to look in great details, what actually happens when users try to find the desired material in a library. This study, therefore, has investigated and assessed the usability of qualitative method in contrast with a quantitative one, while observing how the users search an OPAC. We shall, however, start with the definitional aspects of the above mentioned terms, like qualitative methodology, quantitative methodology, users studies, etc, followed the brief analysis of theoretical frameworks of quantitative and qualitative methodologies.

1.2 DEFINITIONS

A copious number of terms have been used throughout this dissertation. This section has tried to succinctly but clearly define the terms, which have significant roles.

1.2.1 Research methods
Research, as defined by D. Slesinger and M. Stephenson in The Encyclopaedia of Social Sciences, is "The manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art", and research methods, as defined by Kothari (1990), "may be understood as all those methods/techniques that are used for conduction of research. Research methods or techniques, thus, refer to the
methods the researchers use in performing research operations. In other words, all those methods which are used by the researcher during the course of studying his research problem are termed as research methods". Therefore, the **Research Method** can be defined as the method/technique to conduct a research for the purpose of generalization to extend, correct or verify knowledge.

1.2.2 Research methodology

Research methodology not only incorporates research methods "but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using others so that research results are capable of being evaluated either by the research himself or by others. Why a research study has been undertaken, how the research problem has been defined, in what way and why the hypothesis has been formulated, what data have been collected and what particular method has been adopted, why particular techniques of analysing data has been used and a host of similar other questions are usually answered when we talk of research methodology concerning a research problem or study." (Kothari, 1990) Precisely, with this meaning of Research Methodology we will proceed to analyse other related concepts.
1.2.3 Qualitative and quantitative methods
The positivist paradigm – also called empiricism, objectivism, quantitative, or scientific paradigm – can be traced back to the early nineteenth century. The positivist philosophy "assumes that there are social facts with an objective reality apart from the beliefs of individuals" (Firestone, 1987). Therefore, quantitative methods attempt to explain social phenomena through the use of objective measures and statistical analysis. Quantitative researchers attempt to achieve objectivity by using experimental designs and correlation studies, thinking that these techniques will reduce or eliminate error and bias. They, therefore, place heavy emphasis on procedures and statistics.

These quantitative methods are built on positivism, an epistemological stance, which has been severely criticized for more than four decades (Howe, 1985). As the propagators of qualitative methods are the last entrants in the domain of social research, most of the definitions of qualitative method have been drawn against what is not a quantitative method. Some authors, instead of defining what is qualitative research, attempted to isolate defining characteristics of qualitative research. Some authors, however, tried to purvey all encompassing definitions, as Van Maanen suggests, "The label qualitative methods has no precise meaning in any of the social sciences. It is at best an umbrella term covering an
array of interpretive techniques which seek to describe, decode, translate and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world" (van Maanen, 1983).

In contrast to technical definition of quantitative research, which denotes any research based on percentage, means, chi-squares, and other statistics appropriate to cardinal, or counting, numbers and qualitative research which denotes any research distinguished by the absence of counting, Kirk and Miller preferred to define qualitative research as "an empirical, social located phenomenon, not simply a residual grab-bag comprising all things that are 'not quantitative'. Its diverse expressions include analytic induction, content analysis, semiotics, hermeneutics, elite interviewing, the study of life histories, and certain archival, computer and statistical manipulations" (Kirk and Miller, 1986).

Cassell and Symon, in the process of identifying the kernel characteristics of qualitative research, reached to the conclusion that it includes, "a focus on interpretation rather than quantification; an emphasis on subjectivity rather than objectivity; flexibility in the process of conducting research; an orientation towards process rather than outcome; a concern with context - regarding behaviour and situation as inextricably linked in forming
experience; and finally, an explicit recognition of the impact of the research process on the research situation" (Cassell and Symon, 1994).

There seems to be a lot of controversy over the use of the terms like 'quantitative' and 'qualitative', too. Bryman identified that " Guba and Lincoln propose a contrast between rationalistic (i.e. quantitative) and naturalistic (i.e. qualitative) paradigms. While Evered and Louis use a contrast between 'inquire from the outside' and 'inquire from the inside'. Magoon and J.K. Smith refer to 'constructivist' and 'interpretive' approaches." (Bryman, 1988).

These separate and multiple uses and meanings of the methods of qualitative research make it difficult for researchers to agree on any essential definition of the field. However, for the purpose of this discourse a workable definition must be established, which reads like this: **Qualitative research is an interdisciplinary, and trans-disciplinary set of methods, which emphasises on interpretation, subjectivity and context of research situation than quantification, objectivity and counting of social phenomena. Its practitioners are committed to the naturalistic perspective and to the interpretative understanding of human experience.**
1.2.4 User studies
The term 'user studies' has been defined variously by different Information Scientists. According to Wysoki, user studies or use studies could be concerned with studying information processing activities of the users (Wysoki, 1969). Empirical studies of the use of, demand or need for, information are usually called user studies (Brittain 1970). The working definition of user study adopted by Center for Research on user is that the general objectives of research on users is to further understanding of the processes of information transfer. The research may be expected to lead to the improvement of information transfer systems of all types and to have implications for the organization of communication, the distribution of research and the relationships between systems (Cronin, 1981). In the light of the above definition, a study, which is focused on users to understand directly or indirectly their information needs, use behaviour and use pattern, is usually called user study.

1.2.5 Verbal protocol
As discussed earlier, in the positivist or quantitative tradition, observation is concerned only with the overt behaviours. However, Ingwersen has emphasised on the cognitive aspects of information retrieval and emphasised that it is important to have knowledge about the underlying thoughts and cognitive processes related to search behaviour (Ingwersen, 1982). A verbalization technique, known as 'Verbal Protocol' or 'Think-aloud Protocol', was developed to
provide valid and reliable thought data for studying thoughts and cognitive processes while performing tasks (Wang, 1999). Verbal protocol is a self-report of behaviour, which usually includes the individual’s reasoning about that behaviour. According to Johnson and Briggs, verbal protocol “is the term given to the commentary or verbalization produced by an individual or small team when asked to described what they are doing, why they are doing it, what they are about to do, what they hope to achieve, etc. with respect to a particular task or behaviour” (Johnson and Briggs, 1994). Protocol analysis is a qualitative method that may be applied to results from "talk aloud" so as to categorise verbal behaviour elicited during completion of a task. Protocol analysis has largely been applied in the context of problem-solving and other fields of cognitive science (Mason, 2002). It is a research method used predominantly as a way to gain information about the cognitive processes of a participant’s internal states using verbal reports. Therefore, the operational definition of Verbal Protocol analysis for this study is that, it offers a means of gaining insight into the way in which end-users conceive of systems, be they a small software packages, a Online Public Access Catalogue (OPAC) or a entire library system.

The Verbal Protocol method is also known as ‘think aloud’, ‘talk aloud’, ‘concurrent verbalization’ or thought-listing techniques. Gathering information after a task is completed is called Retrospective Verbal Reports
or 'think after'. For this study, we have used only the first method, that is, 'think aloud' and has been used with the term 'talk aloud', interchangeably.

1.2.6 OPAC
The Online Public (also used as Patron) Access Catalogues (OPAC), as the name reveals, allow the users to search and access the library bibliographic data, stored in machine readable format, by means of a number of access points, both conventional (like author, title, class number or call number or subject headings) and unconventional (like word-from-titles, subject headings, authors or other names, and search statements may be compiled by linking search terms using Boolean operators). The data searched and retrieved through such process are displayed on the terminal screen, which may be housed in the library or elsewhere.

1.3 THEORETICAL PARADIGMS
Most of the available methodology textbooks have reduced the methodologies into their mere investigation techniques. In most of cases, quantitative methods have been exemplified by the social survey and experimental investigation, whereas, qualitative methods have been associated with participant observation and unstructured interviewing. However, during 1970s the systematic and conscious broader philosophical issues about the differences among these methods started to gain attention. Positivism, which defines that all our knowledge of world derived
from sensory experience and the only way of knowledge investigation is through the methods of the sciences, provided the major support for using the quantitative methods in social sciences. With the growing influence and awareness of social phenomenologists, symbolic interactionists and logical positivists, the domination of so-called scientific approach - in the form of survey and experiment – it was realized that quantitative methods failed to differentiate between people and objects of the natural sciences. In fact, the conflict between the two domains of methodology generated from the controversy of the appropriateness of natural sciences paradigms to be used in social sciences.

These last three decades observed several debates regarding the superiority of one or the other, of the two major social science paradigms, known as positivism/empiricism and constructivism/phenomenology. "The positivist paradigm underlies what are called quantitative methods, while the constructivist paradigm underlies qualitative methods. Therefore, the debate between these two paradigms has sometimes been called the qualitative-quantitative debate. ...These paradigm wars have been fought across several 'battlefields' concerning important conceptual issues, such as the 'nature of reality' or the 'possibility of causal linkages" (Tashakkori and Teddlie, 1998). Quantitative methods emphasize the measurement and analysis of causal relationships between variable and not processes.
Whereas, “Qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry. Such researchers emphasize the value-laden nature of inquiry. They seek answers to questions that stress how social experience is created and given meaning” (Denzin and Lincoln, 1994). Let us now try to understand the basic tenets of both paradigms.

1.3.1 Positivism and Quantitative Methods
Positivism, the bedrock of quantitative methods or so-called scientific method, credited with providing the outlines of the social scientists' understanding of what science entails. The basic point about positivism is that it is a philosophy that proclaims the suitability of the Scientific methods to all forms of knowledge.

Positivism entails a belief that the methods and procedures of the natural sciences are appropriate to the social sciences. This view involves a conviction that the fact that the subjects of the social sciences - people - think, have feelings, communicate through language and otherwise, attribute meaning to their environment, and superficially appear to be uniquely different from one another is terms of their beliefs and personal characteristics - qualities not normally held to describe the objects of the
natural scientist - is not an obstacle to the implementation of the scientific methods.

Positivism entails a belief that only those phenomena, which are observable, in the sense of being amenable to the senses, can validly be warranted as knowledge. This means that, phenomena, which cannot be observed either directly through experience and observation or indirectly with the aid of instruments, have no place. Such a position rules out any possibility of incorporating metaphysical notions of 'feelings' or 'subjective experience' into the realms of social scientific knowledge unless they can be rendered observable (Bryman, 1988). These philosophical standpoints ultimately pushed the social scientists to believe that 'We're doing science' and take the refuge of experimental designs and survey researches, well equipped with the quantification tools, like statistics, and reduced the whole society as a object of understanding only through mere observable facts and numbers. Thus the whole human society or any part of it, which is bound together by interacted invisible forces like 'feelings', 'subjective experiences' became a negligible factor of quantitative researching and failed to differentiate between people and objects of the natural sciences.

1.3.2 Qualitative research and its intellectual underpinnings

The positivists received a major setback with the raise of Phenomenology, a distinct sociological school, established by German philosopher Edmund
Husserl, according to whom all notions of an external world are mediated through mental consciousness. With the further elaboration of Phenomenology by Alfred Schutz, Max Scheler and their followers, came into existence a totally new set of methods, primarily known as qualitative methods. The phenomenologist views human behaviour as a product of how people interpret their world. The task of the phenomenologist, and, for us, the qualitative methodologists, is to capture this process of interpretation. In order to grasp the meanings of a person's behaviour, the phenomenologist attempts to see things from that person's point of view (Bogdan and Taylor, 1975). For Merriam, "qualitative research assumes that there are multiple realities – that the world is not an objective thing out there but a function of personal interaction and perception" (Merriam, 1988). A qualitative researcher stresses "the socially constructed nature of reality, the intimate relationship between the researcher and what is studied and the situational constraints that shape inquiry" (Denzin & Lincoln, 1998). As a result, the qualitative researcher is the primary instrument for data collection, analysis and interpretation (Creswell, 1994).

Qualitative research methods involve the systematic collection, organization and interpretation of textual material derived from talk or observation. It is used in the exploration of meanings of social phenomena as experienced by individuals themselves, in their natural context. Subscribing to Janesick's
(Janesick, 1994) interpretations about the qualitative research, following is a set of modified characteristics of qualitative research:

- Qualitative research is holistic. It looks at the larger picture, the whole picture and begins with a search for understanding of the whole.
- Qualitative research looks at relationships within a system.
- Qualitative research refers to the personal, face-to-face and immediate.
- Qualitative research is focused on understanding a given social setting, not necessarily on making predictions about that setting.
- Qualitative research demands that researcher stay in the setting over time and gets acquainted with the system, thoroughly.
- Qualitative research demands time in analysis equal to the time in the field.
- In qualitative research the researcher requires to become the research instruments, which means, the researcher shall have the ability to observe and face-to-face interview.
- Qualitative research requires ongoing analyses of the data.

Qualitative research, as a set of interpretative practice, privileges no single methodology over any other. Multiple theoretical paradigms claim use of qualitative research methods and strategies, from Constructivism to cultural studies, feminism, Marxism and ethnic models of study.
Qualitative research does not have a distinct set of methods that are entirely its own. Qualitative researchers use semiotics, narrative, content, discourse, archival, and phonemic analysis, even statistics. They also draw upon and utilize the approaches, methods, and techniques of ethnomethodology, phenomenology, hermeneutics, feminism, rhizomatics, deconstructionism, ethnographies, interviews, psychoanalysis, cultural studies, survey research and participant observation, among others. (Nelson, Treichler and Grossberg, 1992) All of these research practices can provide important insights and knowledge. No specific method or practice can be privileged over any other, and none can be eliminated out of hand.

1.3.3 The Triangulation
There are, however, a number of later sociological schools, namely, Logical Positivism of Ludwig Wittgenstein and 'Vienna Circle', who subscribed to the qualitative researching and believe that "Social phenomena exist not only in the mind but also in the objective-world and that there are some lawful and reasonably stable relations to be found among them"(Miles and Huberman, 1984), who of course can easily be placed in the centre-most position, in this polemic. In fact, this centre-most position derived when Campbell and Fiske argued that "In contrast with single operationalism now dominated in psychology, we are advocating ... a methodological triangulation" (Campbell and Fiske, 1959). Denzin, however, was the first
to advocate and popularise the use of triangulation in qualitative research (Denzin, 1970).

The term "triangulation" originally adopted from a method of surveying or navigating, "in which people discover their position on a map by taking bearings on two landmarks, lines from which will intersect at the observer's position. If only one landmark were taken, the observer would only know that they were situated somewhere along a line. Triangulation used in this way assumes a single fixed reality that can be known objectively through the use of multiple methods of social research" (Seale, 1999).

Denzin identified four types of triangulation (Denzin, 1978), these are:

- **Data Triangulation**: uses variety of data sources in a study, so that one seeks out instances of a phenomenon in several different settings, at different time and space so that phenomenon can be described better;
- **Investigator Triangulation**: use of several different researchers or evaluators so that personal biases can be reduced;
- **Theory Triangulation**: use of multiple perspectives to interpret a single set of data, in other words, approach a single set of data with several hypotheses in mind;
- **Methodological Triangulation**: using of multiple methods to study a single problem, which is a rationale for mixing qualitative and quantitative methods in study.

This fourth type is popularly known as "triangulation" and has been widely accepted as meaning of it. This has helped a group of social scientists to employ both qualitative and quantitative methods as complementary to
each other, however, without understanding that “quantitative and qualitative methods are more than just differences between research strategies and data collection procedures. The approaches represent fundamentally different epistemological frameworks for conceptualising the nature of knowing, social reality, and procedures for comprehending these phenomena” (Filstead, 1979). We, therefore, disagree with this fourth type of “triangulation”.

1.4 SIGNIFICANCE OF THE STUDY

This study demonstrates that how a qualitative method can be successfully used in OPAC search study and above all, library user study, especially in an electronic environment. The findings of this research provide significant information for future researchers and librarians who are interested to understand the library users fully and comprehensively in their own context, which is otherwise difficult with any quantitative method. An in-depth understanding can inform the researchers and librarians how to successfully understand and facilitate the library services in electronic environments. This study describes how the users interact with and retrieves information from OPAC and how they navigate within that system. It also provides an understanding of the search strategies and search terms the users employ in a variety of information search situations. The researchers and librarians will be able to use the research as a basis to
begin their own observations of the information seeking of their users. The use of the Think Aloud method will also be significant. The method has been used infrequently in LIS research.

In the present day scenario, one of the major concerns for Library and Information Science professionals is how to implement user-centric research methods. Several options are though open, Qualitative Method, is however, a useful answer to that.